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V. *Part of a Letter from ——— of Cambridge, to a Friend of the ROYAL SOCIETY, occasioned by what has lately been reported concerning the Insect mentioned in Page 218 of this Transaction.*

Nov. 20. 1742.

Read Nov. 25.
1742.

THE last News from *Paris* gives something very surprising in the Account of *Monsieur Reaumur's* late Memoir, read in the *Royal Academy of Sciences* there, concerning an Animal called a *Polypus*, in which Life is said to be preserved, after it has been cut into several Pieces, so that One Animal seems by Section to be immediately divided into Two or Three more complete Animals, each separately enjoying Life, and continuing to perform the proper Offices of its Species.

Such an Account would have been less regarded, had we not been informed before, that Two * Letters had been communicated to the ROYAL SOCIETY, some Months since, from good Hands, both which mentioned the same thing, and related it as a Fact averred, and carefully examined, by one of the greatest Judges, and most indefatigable Promoters, of Natural History, and especially of that Part of it, which leads to the Knowledge of what is most particular and remarkable in the Insect and Reptile Part of the Creation.

Some of our Friends, who are firmly attached to the general Metaphysical Notions we have formerly learned, reason strongly against the very Possibility of such a Fact: but as I have myself for-

* See above p. 219 and 220.

merly owned to you, on other Occasions, my Distrust of the Truth, or Certainty at least, of some of those Principles, which I never yet had a sufficient Understanding of, to give a full and clear Assent to; I shall now make no Scruple of acknowledging, that I have already seen so many strange things in Nature, that I am become very diffident of all general Assertions, and very cautious in affirming, what may, or may not possibly be.

The most common Operations both of the Animal and Vegetable World are all in themselves astonishing; and nothing but daily Experience, and constant Observation, makes us see, without Amazement, an Animal bring forth another of the same Kind; or a Tree blossom, and bear Leaves and Fruit.

The same Observation, and daily Experience, make it also familiar to us, that besides the first Way of propagating Vegetables from their respective Fruit and Seed, they are also propagated from Cuttings; and every one knows, that a Twig of a *Willow* particularly, cut off and only stuck into the Ground, does presently take Root and grow, and becomes as much a real and perfect Tree, as the original one from which it was first taken.

Here is then, in the Vegetable Kingdom, the very thing quite common, that *Monsieur Reaumur's* Memoir is said to give a rare Example of in the Animal. The best Philosophers have long observed very strong Analogies between these two Classes of Beings: and the Moderns, as they have penetrated further into Nature, have every Day found Reason to extend that Analogy: some have even with great Probability

bility talked of a Scale of Nature, in which she, by an insensible Transition, passed from the most perfect of Animals, not only to the most imperfect, and thence to the most imperfect of Vegetables, but even through Coralline Bodies, and Minerals, to the very Earths and Stones, which seem the most inanimate Parts of our Globe.

Now in such a Scale, who is the Man that will be bold to say, Just here Animal Life intirely ends, and here Vegetable Life begins? Or, Just thus far, and no further, one sort of Operations goes, and just here another sort quite different takes its Place? Or, again, Who will venture to say, Life in every Animal is a Thing absolutely different from that which we dignify by the same Name in every Vegetable? And might not a Man even be excused, if he should modestly doubt, whether Plants and Vegetables may not themselves be considered as a very low and imperfect Tribe of Animals; as Animals might, in like manner, be considered as a more perfect and exalted kind of Vegetables?

We see the Two Sexes of Male and Female run through all the higher Parts of the Animal Creation; yet would he have gone a great deal too far, who should have thence asserted, there were no Exceptions to this general Oeconomy; or that this was one of the general and distinguishing Affections of all the Animal Kind: For modern Discoveries have informed us, that there is somewhat very analogous to this in the Vegetable Creation also: And even in the Animal it has been found, that *Snails*, *Earth-worms*, and some others, are really Hermaphrodites, having in themselves the Organs of both Sexes; whilst the work-
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ing *Bee* is truly of no Sex at all, nor any-ways employed in the Production of that Species, it labours so hard daily to provide with Food.

But, whereas, in Animals, the Division of the Sexes is almost general; and the Union of them in one Subject appears but in a few Instances; contrarywise, in Vegetables, almost all have the whole Apparatus of Generation in each Individual, whilst only a few Sorts seem to emulate Animals in what is analogous to the Division of them.

I seem, perhaps, to wander too much from the Point first-mentioned; but as I am only offering loose Hints, and such wild Conjectures as come in my Way, hope to be excused, though I yet hazard another Observation, which is, That what appears chiefly to be new, in the Subject of this Memoir, is, that the Animal or Animals live and do well after their Separation, and that they are capable of re-producing such Parts as the Head and the Tail, which seemed essentially wanting.

I say, that the Animal's living and doing well again, is what is chiefly new; for that an Animal, after Separation of some of the principal Parts, seems for some time to retain Life in each Part, must have been observed by every body*; and though People generally

* The Antients have taken Notice of this, and some even seem to have had no doubt, that Life continued some time in the Parts of a divided Insect. *Aristotle* observes in the Fourth Book of his History of Animals, that almost all Insects live some time when pulled asunder, *Wasps* particularly; and that those live longest, when so separated, which have a long Body, and many Feet; so that the *Scolopendra* being cut asunder, one Part moves on forwards, and the other backwards. But a
Pas-

rally say, from their Prejudice in favour of some of the Principles above hinted at, that to be sure only one of the Parts, though they know not always which, *feels* and has the Sensation of Pain ; yet have all I have ever talked with on the Subject, as freely acknowledged, that the *Phænomena* appeared on the other Side.

A *Chicken*, or a *Pigeon*, whose Head is suddenly struck off, shews in both Parts, if no preconceived Opinion led us to think otherwise, strong Signs of Pain and Suffering, and the very same Signs, that the respective Parts of the Animal shew of that Sensation, whilst it is surely living and intire : And I have been told by some, who have seen the Heads of Malefactors suddenly severed from their Bodies, that the same Observation holds also in our own Species. But we have all seen it hold much stronger in the more im-

Passage of St. *Austin* is so remarkable on this Head, that I cannot help transcribing it: *Me revocat quod bis hausi oculis Cum enim nuper in agro essemus Liguriæ, nostri illi Adolescentes, qui tunc mecum erant studiorum suorum gratia, animadverterunt humi jacentes in opaco loco reptantem bestiolam multipedem, longum dico quemdam vermiculum: vulgo notus est; hoc tamen quod dicam nunquam in eo expertus eram; verso namque stylo, quem forte habebat, unus illorum animal medium percussit: tum ambæ partes corporis ab illo vulnere in contraria discesserunt, tanta pedum celeritate, ac nihilo imbecilliore nisu, quam si duo hujusmodi animantia forent. Quo miraculo exterriti, causæque curiosi, ad nos, ubi simul ego & Alypius confidebamus, alacriter vivientia illa frustra detulerunt. Neque nos parum commoti, ea currere in tabula quaquaversum poterant, cernebamus; atque unum ipsorum, stylo tactum, contorquebat se ad doloris locum, nihil sentiente alio, ac suos alibi motus peragente. Quid plura? Tentavimus quatenus id valeret; atque vermiculum, imo jam vermiculos, in multas partes concidimus: ita omnes movebantur, ut nisi a nobis illud factum esset, & comparerent vulnera recentia, totidem illos separatim natos, ac sibi quæquam vixisse crederemus.*

Aug. Lib. de Quantitate Animæ.

perfect

perfect Animals, as they are commonly called, such as *Worms*, where, on the Separation of the Body into two Parts, Life has continued seemingly in both, and with strong Signs of it, longer than we have had the Patience to attend and examine. We have been, indeed, quite uncertain, in which of the Parts this seeming Life has been most conspicuous: and as both Parts have seemed to endeavour to get away, and have frequently soon after been found missing, Boys and ordinary People are generally possessed of an Opinion, that they unite and grow together again after their Separation.

Now, if it could once be allowed, that Animal Life and Sensation might subsist but an Instant, in both Parts of the Creature, after its Section; the whole remaining Difficulty would be only as to the Cure of the Wounds, and the Reproduction of the necessary Organs that are wanting. And, for the first of these, we know very well, that the more imperfect Animals are killed with much greater Difficulty than the more perfect, their Vitals being more diffused, and their general Organization being, I suppose, far more simple than that of the higher Tribes: And as to the other, I think no one will see any Impossibility in the Reproduction of certain Parts, after what we have seen and read of, in the *Lobster* and *Cray-fish* Kinds, who when they chance by any Misfortune to lose a Claw, reproduce it in a short time, with all its Joints, and the proper Muscles for moving them; all which appears as difficult as the regaining of a Mouth and a Tail to some of the *Worm-kind*; whose general Organization being simple, and consisting chiefly of only one strait Gut, or Passage, from the Mouth to the
Vent,

Vent, they seem to want little more to reproduce either, than a Contraction of the Wound, with the Assistance of the Muscles that move the several Rings of which the Body is composed; and every one of which, in its first and natural State, performs almost the same Motions as are necessary for Suction or Ejection: the latter of which we have even sometimes seen very wonderfully supplied in our own Species, in those Cases, where grievous Wounds of the Intestines have put Nature upon trying to perform her Operations in a new Way.

Upon the Whole, we are all very desirous to see *Monsieur Reaumur's* Memoir on this curious Subject; we hope it will soon be published, when, as his curious and exact Experiments will afford infinite Entertainment, so his judicious Remarks upon them will doubtless be no less instructive; but will, in all Probability, give a Light into these Matters we do not yet think of. In the mean time I could not help just mentioning to you, what came into my own Head on the Occasion, hoping that however you may look on my Thoughts as the Dreams, perhaps, of a Man bewildered in his Inquiries into Nature, you will still believe me to be a firm and constant Lover of Truth, and ready at all times to receive and embrace whatever is really such, however odd and surprising it may at the first chance to appear.

I shall therefore only add one or two Facts I should indeed have mentioned before, when I was speaking of the Difficulty of killing some of the Tribes of Insects and Reptiles; which are, that I have myself seen the Heart of a *Viper* continue its regular Beats more than Six Hours after it had been taken out of

the Body: That I have seen that Body move and seem alive to all Purposes for a great Part of the same time, after having lost the Heart; and that I have seen *Wasps*, whose Heads had been taken off, creeping in the Window the next Day; and *Butterflies* that have lived, and attempted even to fly, several Days after undergoing the same severe Operation.

Insects seem at first to suffer but little from the Loss of their hinder Parts, although these contain most of their *Viscera*; nor does the Loss of Limbs seem to affect them in any Proportion to the more perfect Animals. But even in our own Kind, in Infancy, before the Parts have lost all their Softness, much greater Wounds may be received without Loss of Life, than afterwards. If we go yet further back to our *Embryo* State, it is very probable, that yet vastly greater Hurts are recoverable: And it is upon that Principle chiefly, that the best and most likely Account has been given by modern Writers in Anatomy, of some very remarkable Monsters that have appeared in the World, where even some of the most essential Parts of Two *Fætus's* have been seen wonderfully united in One and the same Body. I shall now detain you no longer, than to assure you, that I am, with Truth and Respect,

S I R,

Your most obedient,

Humble Servant, &c.